Welcome to Glyph!
Please Read Me First

Thank you for selecting and purchasing a SCSI product from Glyph Technologies. You have made an excellent decision because your Glyph drive will provide you years of faithful service with proper use and under normal conditions. Your Glyph drive has been optimized for use in audio/visual applications. ***Please take the time to fill out your warranty card and mail it to us.*** Your warranty won't be registered until you do so. As you are probably painfully aware of, with the rapid change in technology, up to date information is critical. Glyph offers excellent technical support and service policies to you and all our users. In our testing facility we have found that many technical support issues can be solved by proper installation and implementation. Please read your documentation (Quickstart, addendums, etc.) and "Read Me" files carefully.

Product Packaging

Check the box that your Glyph product was shipped in for damage or tampering. If you feel that the shipping container has been previously opened or parts are damaged or missing, immediately contact your dealer and report any damage to the shipping company that delivered your Glyph product. Keep your box and packaging for future movement or shipping of your Glyph product.

Back Up Your Stuff! ... Please! Please! Please! Please! Please!

What does backup mean? You **cannot** consider your data to be backed up ***unless your data exists on more than one, non-hard drive storage medium***. If you have purchased a Glyph SCSI storage device, please don't forget to back up important data and software. As drive capacities get larger and users store more data, back up has never become more important. Many users will invest in gigabytes of storage, but not in a back up device. Data recovery from a crashed hard drive is never easy and always expensive. Check out the enclosed Glyph Product Brochure or call your Glyph Dealer for a qualified recommendation.

Glyph Technical Support

Should you have problems or questions that you are unable to resolve, Glyph provides you with technical support via 3 methods:

1) Phone (607) 275-0154 from 9:00 am - 6:00 pm E.S.T.

2) e-mail: tech@glyphtech.com

3) Web Site: http:/www.glyphtech.com

Warranty and Service Issues

If your Glyph product is not functioning properly, call Glyph Technical Support and we will do our best to help you diagnose the problem. If there is a problem with the drive mechanism, you will be issued an RMA (Return Merchandise Authorization) number. This number is how our Service Department tracks *your,* specific drive's situation, so *please* make sure your number is displayed clearly on the *outside* of your drive's shipping box. **NO RETURNS** will be accepted **without** the **proper RMA** number.

Now that you are the proud owner of a Glyph storage product, we will provide you several valuable services under warranty:

- Your warranty and registration applies to you and only you, the *purchaser* of the product. Your warranty period *begins on the date of your purchase* and lasts *exactly* the length of time specified within the terms of your warranty. Warranty periods do vary throughout the Glyph product line, so be sure that your information is accurate and specific to the product you have purchased.
- In the event your drive goes down and has to be returned to the Glyph Service Center, you need only to pay for the shipping to us. Under the terms of your warranty, Glyph will absorb all costs for parts and labor, as well as return shipping costs via FED EX Saver.
- It's best to ship your Glyph drive in the original packaging. All of our products are shipped in boxes which are specially designed for the drives they contain. If you lose or discard your Glyph packaging, make sure to cushion the drive appropriately. Glyph will not be responsible for any shipping damages to a drive mechanism or enclosure as a result of poor packing.
- The expected turnaround time on drive repair and replacement is 48 hours from the *receipt* of your RMA'd drive. This is, of course, contingent upon the availability of your specific drive mechanism. For example, if the drive in question is no longer in production, there's no way to replace it with a new mechanism. In this, and similar, situations, your drive would be replaced with a comparable mechanism, at no extra cost to you.

Out of Warranty Policies

If your Glyph product is in need of service after the warranty expires, do not despair ... Glyph will diagnose and give you an estimate of repair time and cost then contact you for approval before repairing your drive. You will be responsible for shipping expenses both to and from Glyph in addition to parts and labor. If you need expedited service, ask us about special air shipping rates.

GLYPH DigDAT Features

Drive Feature Descriptions

The Glyph DigDAT offers a native storage capacity of 6 GB or 120 minutes of MPEG-2 quality video stored on 120 meters of tape. The DigDAT offers a data storage capacity of 12 GB, assuming 2:1 compression. Since MPEG-2 video is already compressed, additional video storage capacity is not obtained by DCLZ compression.

*** Note: In order to use the video features of the Glyph DigDAT drive, you must have the MPEG-2 video hardware and software to encode / decode the MPEG-2 data. This hardware / software will be more readily available at the consumer level in the near future.*

Playback 3 Hours of MPEG-2 or DVD Recorded Video

When storing video, the encoded rate of the digital stream will determine the file size for a recorded program. Faster transfer rates produce higher quality video but will require a larger storage capacity and reduce the playback time for a given length of tape.

Movies are typically transmitted at an average of 5 MB per second. MPEG-2 can be recorded as low as 3 MB per second but quality is severely degraded. Sporting events and Pay-Per-View are typically transmitted at a much higher data rates for improved image quality. DVD uses a transfer rate of 4.69 MB/s to obtain a total playback time of 132 minutes. DVDS supports the same variable bit recording utilized in DVD encoded video. When recording on a DVDS drive at the same rate as DVD (4.7 MB/s), you can obtain a recording time of 180 minutes or 3 hours. DVDS also supports MPEG-2 rates greater than 6 MB/s with a total record time of 120 minutes.

The MPEG-1 format is often used for instructional video and surveillance where total record time is more important than image quality. For these purposes, the DVDS tape drive can store up to 12 hours of MPEG-1 recorded video.

Sustained Transfer Rate 870 Kb/s

The nominal head rotational speed is 6000 RPM, which is 3.0 times the rotational speed of a standard DDS drive. The improved format efficiency of DVDS allows for a sustained transfer rate of 830 kilobytes per second when operating with EEC C3. This rate assumes that the C3 Error correction overhead is being performed in both read and write operations. When the drive is operating without EEC C3, the sustained transfer rate is improved to 870 kilobytes per second with RAW operation alone. This data rate is the natural streaming rate of raw data to the media and does not include increased rates due to compression of data. This data rate is maintained for both read and write operation.

RISC Based Architecture for Servo and Tape Controller Functions

The Glyph DigDAT drives use a high performance RISC CPU to perform most operational functions. This simplifies the complexity of the functions that reside in the custom tape controller integrated circuit device. This methodology is used to allow for reprogramming control algorithms as well as to allow for other modifications and feature enhancements through field upgradable firmware cartridges.

Video MPEG VCR Commands

Added commands allow the drive to perform functions similar to a typical VCR while recording MPEG programs. The RECORD command saves the time-stamp value for each track of the MPEG stream. This allows the drive to maintain synchronization while Stopping, Pausing, or Recording different MPEG programs. The PAUSE/RESUME commands allows for seamless splicing of digital material by stopping the recording process and remaining in a ready state. Recording can then continue the instant the RESUME command is received from the host. If on playback, the drive detects a new or spliced MPEG stream, it will set a CHECK CONDITION and the REQUEST SENSE command can be issued to retrieve the new time-stamp. This allows the system to quickly resynchronize the audio and video streams to provide a smooth flow between separate transport or program streams.

Digital Video Adaptive Bandwidth Capabilities

Your Glyph DigDAT drive automatically adapts to the encoded data rate of the MPEG stream during playback to maximize the tape capacity. Constant speed recording would result in wasted tape space when recording at slower transfer rates. This adaptive bandwidth capability allows for the recording of one program at CCIR 601 resolution and another at SIF resolution while efficiently utilizing tape capacity.

System Clock Reference and 42 Bit PCR Synchronization

The DigDAT drives synchronize to the MPEG system clock reference and support 42-bit PCR synchronization. This makes the drives capable of automatic frame rate adaptation and allows them to record at different aspect ratios and display resolutions.

Four Head Design with Read-After-Write (RAW) and Reed Solomon Error Correction

The drum contains four heads and incorporates a 90+ degree wrap for the media. This allows Read-After-Write error checking to be performed during a write operation. This method of error checking is designed to detect media defects and filter minor errors that are correctable through ECC.

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The Glyph DigDAT drive incorporates three levels of Reed Solomon Error Correction Code (ECC). The ECC functions are divided between the RISC and the tape controller VLSI device to make the best use of both RISC capabilities and traditional hardware. A dedicated hardware controller in the Tape Formatter performs all of the C1 level ECC functions at the block symbol level. The VLSI device has an ECC engine used to perform the C2 level generation and checking at the frame level and an additional engine to perform all C3 generation and checking at the group level. A VLSI ECC error correction engine is used to correct all errors encountered during read operations.

The drive firmware constantly monitors the types of errors and performs adjustments to compensate for errors without user intervention. During RAW and reading operations, a greater error rate will invoke the bonker (head cleaning mechanism) to try to eliminate the problem without unloading the cartridge. Additionally, the drive will invoke the bonker at periodic intervals to perform preventative maintenance to dislodge contaminants from the head before it becomes a problem.

High Speed Search

During fast forward or fast reverse operations the capstan is disengaged from the media. The heads read the subcode information during high-speed search to perform operations at 200 times the normal transfer rate.

Upon installation of a media cartridge, the RISC CPU can determine within a few revolutions of the cartridge hubs, the relative location on the media. The exact location can then be verified using a high-speed search operation or a read operation. In the case where it is known prior to the high speed search operation that the relative location is incorrect, the media can be moved at high speed to the correct relative location before invoking a high speed search or read operation.

Electrically Programmable Firmware

The operational firmware resides in Flash memory for all forms of this product family. The Flash memory can be loaded via the interface or from a firmware upgrade cartridge. Updates to the firmware can be loaded from a firmware tape cartridge that is read by the drive and then reprogrammed into the Flash memory.

Large 4 Megabyte Buffer

This product family incorporates a DRAM buffer that is designed to allow high transfer rates into and out of the drive. Since the RISC CPU requires 32-bit data, this implies that the memory is organized into 1024 K words by 32-bits. The buffer will maintain overlapped buffer operations (simultaneous interface and media transfers) to provide high transfer rates while streaming to the media. The CPU and tape formatter perform 16 byte burst transfers to minimize the transfer overhead in cache line fills and tape read and write operations.

Supports DDS-1, DDS-2, and DVDS Cartridges

This product supports all DDS-1 and DDS-2 media cartridge types. The DVDS format is not compatible with any competitive DAT/DDS products but does provide interchange capability with other units and future planned DVDS products. In order for you to use your DigDAT drive with DDS-1 and DDS-2 cartridge types, you would need to ship your drive to the Glyph Service Center for an internal modification. This is a free modification within your one (1) year warranty period, you need only pay for shipping expenses to and from Glyph.

*** Note: Attempting this modification yourself voids your warranty.*

Synchronous and Asynchronous Transfer Modes

The SCSI interface device is a FAST SCSI controller capable of a maximum asynchronous transfer rates of 7 MB/s and synchronous transfers of 10 MB/s. The drive also supports the active termination required for FAST SCSI transfers and proper bus termination.

Technology grows and changes extremely quickly within this industry. Please don't take the advice of anyone, other than a direct source (like us or the maufacturer of your software), in regards to the compatibility of software with a mechanism. If you have problems installing or using your software, please contact the manufacturer of that software package. Here is a list of web sites to help in your search for technical information.

Adaptec - www.adaptec.com
Dantz - www.dantz.com
Sonic Foundry - www.sfoundry.com
Hohner - www.hohnermidia.com
Astarte - www.astarte.de
Digidesign - www.digidesign.com
Steinberg - www.steinberg.de

If you can't find the answer to your problem in any of the literature provided with your Glyph drive, please call our dedicated technical support hotline where a real, live human being will pick up the phone to help you.

Technical Support (607) 275-0154

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The Glyph DigDAT Addendum

It Would Be Nice If You Read This!

Welcome! ... and thank you for purchasing a Glyph DigDAT Drive! You've made an *excellent* decision! As part of Glyph's superior dedication to customer support, service and satisfaction, we've included this addendum sheet in the hopes of preventing any *potential problems* before they become *actual problems.*

The acompanying QuickStart manual will take you through the basic unpacking and installation procedures for any Glyph tape drive. This addendum sheet, however, is specific to the DigDAT Drive itself.

The *GREEN* Status LED:

- When this light is fading on and off, this means a tape is in the drive and is being searched for format type, status information, and system log. This process takes about 12 seconds.
- A steady ON state indicates that the tape is initialized and ready to be accessed.
- A slow blinking indicates that the tape is in motion, either positioning to a particular location or completing a previous command.
- A fast blinking indicates that the drive is performing the Power-On Self-Test of the electronics for functionality. A failed test is indicated by a fading yellow LED.
- An ultra-fast blinking indicates that a host request is in progress.
- When both the green and yellow LEDs are alternately fading, the tape is being ejected. Do not hold or repeatedly press the Eject button once the process has started or a Forced Eject may be initiated.

The *YELLOW* Attention LED:

- A fast blinking indicates that a read/write tape error has occurred. This means that the end of media has been reached or that an unrecoverable drive media error was detected.
- An ultra-fast blinking indicates that a mechanism error has occurred. Attempt to eject cartridge. If cartridge cannot be removed, contact the Glyph Service Center for drive repair/replacement information.
- Fading indicates that the Power-On Self-Test has failed. Turn power off and back on. If indication persists, contact the Glyph Service Center for drive repair/replacement information.
- When both the yellow and green LEDs are alternately fading, the tape is being ejected. Do not hold or repeatedly press the Eject button during normal operation or a Forced Eject may be initiated.

The *RED* Cleaning Needed LED indicates:

- A slow blinking indicates that the heads need cleaning or the tape is near the end of its useful life. Clean the heads using a 4mm head-cleaning cartridge and try the operation again. If the Cleaning Needed light reappears, assume that the cartridge is nearing the end of its life. Copy the data onto a new cartridge and discard the old cartridge. The Cleaning Needed signal is cleared after a cleaning cartridge has been loaded and the heads have been cleaned.

DigDAT Tape Loading/Unloading

Insert the cartridge with the arrow on the top of the cartridge entering the slot first. Load the cartridge by pushing against the middle part of the cartridge until it is fully recessed into the cartridge insertion slot. To eject/unload a tape, press the Eject button on the front panel or use the Eject command from the backup software you've chosen. Once the Eject button is pressed, the drive updates the system log with a running count of drive/tape statistics, rewinds the tape to BOM (Beginning of Media), and then ejects the cartridge.

Forced Ejection of a Cartridge

** ***Caution:*** *You may lose data if you force a cartridge ejection. The tape may also be incorrectly formatted following the forced unload.*

If you press the Unload button when the drive is busy, the drive may take some time to respond to the request because it will finish the operation that it is performing first. This ensures that the task is terminated in a controlled manner, and no data is lost. However, occasionally you may have an urgent need to unload a cartridge. To do this, you must perform a forced eject. To perform a forced eject, hold the Eject button down while powering up the drive (cycling the power if on). Once the drive has received the command to force eject, it will wait an additional 30 seconds in an attempt to complete its tasks and perform a normal eject procedure. Once this time period has elapsed, the tape is immediately unthreaded and the cartridge is ejected, regardless of what operation the drive was performing. The drive is then reset as though the power had been cycled.

Using a Blank Cartridge with the DigDAT

When you insert a blank cartridge into the DigDAT for the first time, it is automatically initialized. The drive first detects that the tape is blank. It then initializes the tape when it receives a command that causes writing to the tape or a mode select is issued to partition the tape.

** ***Note:*** *Initializing the tape will take several minutes. Ejecting the cartridge before the initialization is completed causes the procedure to abort. The initialization then restarts from the beginning the next time a WRITE command is received.*

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If the first WRITE command stores less than the group buffer, the data is placed in the cache until the next WRITE command exceeds the group buffer capacity and forces the cached data to actually be written to tape.

The following steps outline a typical sequence for using a blank cartridge.

1. Gently push the blank cartridge into the cartridge insertion slot on the front panel. Once the cartridge is partially inserted, the drive mechanism automatically completes the cartridge insertion and proper positioning.
2. The green LED will slow fade on/off to indicate that a tape is inserted and the tape is being read. The drive checks the cartridge to determine its state (blank, write-protected, prerecorded, firmware update, etc.) and position to the data area, which takes about 20 seconds.
3. Start the software application and issue a command.
4. For example, if you want to backup a file, issue the appropriate command or make the appropriate menu selections from backup software. The green LED will flash slowly to indicate that the operation is in progress. The Glyph DigDAT begins initializing the tape before starting the backup (WRITE) operation.
5. After the backup is completed and the green LED is STEADY ON. Push the eject button on the front panel or issue a software Eject command to remove the cartridge. The green and yellow LEDs will alternately fade on/off to indicate that the ejection process has begun. The buffer is then emptied to tape, the EOD is written, the system log updated, and the cartridge is rewound and ejected.

Using a Cartridge Containing Data

The sequence for writing to a cartridge that already contains data is similar to the blank cartridge sequence except that the cartridge is not automatically initialized by the drive. A brief delay occurs when the cartridge is first inserted as the drive identifies the cartridge type and state, and positions to the data area.

Write-Protecting a Cartridge

A cartridge can be write-protected by sliding the tab on the rear of the cartridge so that the hole is open. With the Write-Protect hole open, data can be read from the tape but not written to it.

** **Note:** The System Log, which contains the history of tape usage, will not be updated when the cartridge is write-protected. If your application makes use of the System Log, it becomes inaccurate if the tape is used while write-protected.

Cartridges

Use only qualified DDS or DVDS certified cartridges. Only qualified cartridges have passed strict inspection and testing to ensure tape quality. Four recognition holes allow the drive sensors to identify the type of tape, its magnetic thickness, and to determine whether the tape is prerecorded, unrecorded, or a cleaning cartridge. The DigDAT drive uses these holes to recognize 120 meter MP+ and other MRS cartridges. MRS cartridges have a series of alternate opaque and clear stripes at the beginning of the tape. This striping classifies the media as data grade, rather than audio grade media.

Head Cleaning

If an excessive number of Read-After-Write (RAW) or Error Correction (ECC) errors are detected during normal operation, a bonker (internal head cleaner) will attempt to dislodge the contaminates. If after several tries the error rate is not reduced, the red Cleaning Needed light flashes slowly.

Dirty heads or a worn out cartridge could cause this condition. Clean the heads using a 4mm head-cleaning cartridge and try the operation again. If the Cleaning Needed light reappears, assume that the cartridge is nearing the end of its useful life. Copy the data onto a new cartridge and discard the old cartridge. The Cleaning Needed signal is cleared after a cleaning cartridge has been loaded and the heads have been cleaned.

To clean the heads, insert a cleaning cartridge designed for 4mm drives. The tape is automatically recognized as a cleaning cartridge and the operation is begun. The cleaning process takes approximately 60 seconds and the tape is then ejected.

** *Note: Each time the cleaning cartridge is loaded, a new, unused portion of cleaning tape is advanced over the entire tape path. Eventually, the entire tape is used, and a new cleaning cartridge is required. The drive will not rewind a cleaning tape. A cleaning cartridge should provide approximately 30 uses or as recommended by the manufacture.*

The tape heads should be cleaned regularly to maintain the reliable operation and performance of your Glyph DigDAT tape drive. As routine maintenance, the drive heads should be cleaned after the first 8 hours of tape movement for a new tape and thereafter each 24 hours of read/write operation.

Technology grows and changes extremely quickly within this industry. Please don't take the advice of anyone, other than a direct source (like us or the maufacturer of your software), in regards to the compatibility of software with a mechanism. If you have problems installing or using your software, please contact the manufacturer of that software package. Here is a list of web sites to help in your search for technical information.

Adaptec - www.adaptec.com
Dantz - www.dantz.com
Sonic Foundry - www.sfoundry.com
Hohner - www.hohnermidia.com
Astarte - www.astarte.de
Digidesign - www.digidesign.com
Steinberg - www.steinberg.de

If you can't find the answer to your problem in any of the literature provided with your Glyph drive, please call our dedicated technical support hotline where a real, live human being will pick up the phone to help you.

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SCUZZY BOY SAYS, "DON'T BE A LOSER, SAVE THIS FOR YOUR RECORDS!!"

6Gb SCSI 4mm DAT DRIVE

T61Q02 Tabletop

Please have this information ready if you call for support.

Assembled in U.S.A.

Kit Includes:

Drive 1 **INDIGITA** **IDT-2500S**

Firmware1 4022

Drive 2

Firmware2

SERIAL#

GLY013424

Date Of Manufacture **10/1/99**